

RECEIVED
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Page 2

Line 20, before "carbon-carbon" insert --compound having a--

Page 4

Line 16, before "carbon-carbon" insert --compound having a--

Page 9

Line 11, before "carbon-carbon" insert --compound having a--

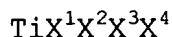
Page 13

Line 25, change "nucleophilic" to --electrophilic--

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Amended) A titanium catalyst for reaction between a compound having a carbon-carbon unsaturated bond and a compound having an electrophilic functional group or an electrophilic reagent, said titanium catalyst being composed of a titanium compound represented by the formula (1) below



(1)

(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-\text{NR}_x\text{R}_y$ group (where R_x and R_y denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring[.]) and a Grignard reagent represented by the formula (2)

below in a molar amount 1-10 times as much as the titanium compound[.]

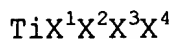


(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom[.]);

wherein the compound having a carbon-carbon unsaturated bond is not styrene.

Claim 2 (Amended) The titanium catalyst as defined in Claim 1, wherein the titanium compound [is one which] has an asymmetric ligand.

Claim 3 (Amended) A process for producing a titanium catalyst for reaction between a compound having a carbon-carbon unsaturated bond and a compound having an electrophilic functional group or an electrophilic reagent, said process comprising reacting a titanium compound represented by the formula (1) below



(1)

(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-NRxRy$ group (where Rx and Ry denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a

ring[.]) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound[.]



(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom[.]);

wherein the compound having a carbon-carbon unsaturated bond is not styrene.

Bl cont.
Claim 4 (Amended) The titanium catalyst as defined in Claim 3, wherein the titanium compound [is one which] has an asymmetric ligand.

Claim 5 (Amended) An organotitanium reacting reagent which is composed of a titanium compound represented by the formula (1) below



(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-NR_xR_y$ group (where R_x and R_y denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring[.]) and a Grignard reagent represented by the formula (2)

below in a molar amount 1-10 times as much as the titanium compound,



(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom[.]), and a compound having a carbon-carbon unsaturated bond;

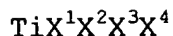
wherein the compound having a carbon-carbon unsaturated bond is not styrene.

Claim 6 (Amended) The organotitanium reacting reagent as defined in Claim [4] 5, wherein the titanium compound [is one which] has an asymmetric ligand.

Claim 7 (Amended) The organotitanium reacting reagent as defined in Claim 5 or 6, wherein the compound having a carbon-carbon unsaturated bond is any of olefin compounds, acetylene compounds, or allene compounds;

wherein the olefin compound is not styrene.

Claim 8 (Amended) A process for producing an organotitanium reacting reagent, said process comprising reacting together a titanium compound represented by the formula (1) below



(1)

(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-\text{NR}_x\text{R}_y$ group (where R_x and R_y denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring[.]) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound[.]

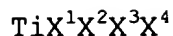


(2)

(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom[.]), and a compound having a carbon-carbon unsaturated bond which is not styrene.

Claim 9 (Amended) The process as defined in Claim 8, wherein the titanium compound [is one which] has an asymmetric ligand.

Claim 11 (Amended) A process for an addition reaction which comprises combining [performing addition reaction on] a compound having a carbon-carbon unsaturated bond and a compound having an electrophilic functional group or an electrophilic reagent, in the presence of a titanium compound represented by the formula (1) below



(1)

(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-\text{NRxRy}$ group (where Rx and Ry denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring[.]) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound



(2)

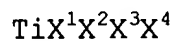
(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom[.]);

wherein the compound having a carbon-carbon unsaturated bond is not styrene.

Claim 12 (Amended) A process for an addition reaction which comprises

adding to [the] an organotitanium reacting reagent [defined in Claim 5] comprising:

a titanium compound represented by formula (I) below



(1)

(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-\text{NRxRy}$

group (where Rx and Ry denote independently a C₁₋₂₀ alkyl group or aralkyl group), and any two of X¹, X², X³, and X⁴ may form a ring) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound



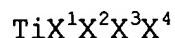
(2)

(where R¹ denotes a C₂₋₁₀ alkyl group having a hydrogen atom at the β position and X⁵ denotes a halogen atom), and a compound having a carbon-carbon unsaturated bond,

a compound having an electrophilic functional group or an electrophilic reagent, thereby performing an addition reaction on [a] the compound having a carbon-carbon unsaturated bond in the presence of said organotitanium reacting reagent,

wherein the compound having a carbon-carbon unsaturated bond is not styrene.

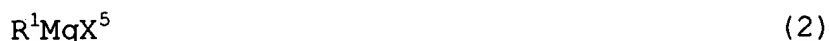
Claim 22 (Amended) A process which comprises reacting a titanium compound represented by the formula (1) below



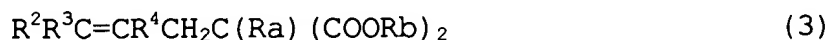
(1)

(where X¹, X², X³, and X⁴ denote independently a halogen atom, C₁₋₂₀ alkoxy group, aralkyloxy group, aryloxy group, or -NRxRy group (where Rx and Ry denote independently a C₁₋₂₀ alkyl group or

aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring[.] and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom[.]) thereby forming a titanium catalyst, and deallylating in the presence of the titanium catalyst an allyl-substituted malonate ester derivative represented by the formula (3) below



B3 cont.
(where R^2 , R^3 , and R^4 denote independently a hydrogen atom or C_{1-10} alkyl group, Ra denotes a C_{1-20} substituted or unsubstituted alkyl group, alkenyl group, or aralkyl group, and Rb denotes a C_{1-10} alkyl group or aralkyl group), thereby giving a malonate ester derivative represented by the formula (4) below

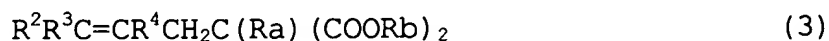


(where Ra and Rb are defined as above).

Claim 23 (Amended) A process which comprises alkylating an allylmalonate ester represented by the formula (5) below



(where R^2 , R^3 , and R^4 denote independently a hydrogen atom or C_{1-10} alkyl group, and Rb denotes a C_{1-10} alkyl group or aralkyl group), thereby giving an allyl-substituted malonate ester derivative represented by the formula (3) below



(where R^2 , R^3 , R^4 , and Rb are defined as above, and Ra denotes a C_{1-20} substituted or unsubstituted alkyl group, alkenyl group, or aralkyl group), reacting this derivative with a titanium compound represented by the formula (1) below



(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-NR_xR_y$ group (where R_x and R_y denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring[.]) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom[.]), thereby forming a titanium catalyst, and performing deallylating reaction in the

B³ concl. presence of the titanium catalyst, thereby giving a malonate ester derivative represented by the formula (4) below



(where Ra and Rb are defined as above).

Please add the following new claims:

Sub-claim
--Claim 25. A titanium catalyst for reaction between a compound having a carbon-carbon unsaturated bond and a compound having an electrophilic functional group or an electrophilic reagent, said titanium catalyst being composed of a titanium compound represented by the formula (1) below



B⁴ (where X¹, X², X³, and X⁴ denote independently a halogen atom, C₁₋₂₀ alkoxy group, aralkyloxy group, aryloxy group, or -NR_xR_y group (where R_x and R_y denote independently a C₁₋₂₀ alkyl group or aralkyl group), and any two of X¹, X², X³, and X⁴ may form a ring) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



(where R¹ denotes a C₂₋₁₀ alkyl group having a hydrogen atom at the β position and X⁵ denotes a halogen atom);

wherein when the compound having a carbon-carbon unsaturated bond is an olefin, the olefin is selected from the group consisting of a substituted or unsubstituted halogenated allyl and a substituted or unsubstituted allyl alcohol derivative; and

wherein the C₂₋₁₀ alkyl group of R¹ does not act as a nucleophile in the reaction.--

By cont. --Claim 26. A process for producing a titanium catalyst for reaction between a compound having a carbon-carbon unsaturated bond and a compound having an electrophilic functional group or an electrophilic reagent, said process comprising reacting a titanium compound represented by the formula (1) below



(where X¹, X², X³, and X⁴ denote independently a halogen atom, C₁₋₂₀ alkoxy group, aralkyloxy group, aryloxy group, or -NR_xR_y group (where R_x and R_y denote independently a C₁₋₂₀ alkyl group or aralkyl group), and any two of X¹, X², X³, and X⁴ may form a ring) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



(where R¹ denotes a C₂₋₁₀ alkyl group having a hydrogen atom at the β position and X⁵ denotes a halogen atom);

wherein when the compound having a carbon-carbon unsaturated bond is an olefin, the olefin is selected from the group consisting of a substituted or unsubstituted halogenated allyl and a substituted or unsubstituted allyl alcohol derivative.--

--Claim 27. An organotitanium reacting reagent which is composed of a titanium compound represented by the formula (1) below



(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-\text{NR}_x\text{R}_y$ group (where R_x and R_y denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom), and a compound having a carbon-carbon unsaturated bond;

wherein when the compound having a carbon-carbon unsaturated bond is an olefin, the olefin is selected from the group

consisting of a substituted or unsubstituted halogenated allyl and a substituted or unsubstituted allyl alcohol derivative; and

wherein the C₂₋₁₀ alkyl group of R¹ does not act as a nucleophile in the reaction.--

--Claim 28. A process for producing an organotitanium reacting reagent, said process comprising reacting together a titanium compound represented by the formula (1) below



(where X¹, X², X³, and X⁴ denote independently a halogen atom, C₁₋₂₀ alkoxy group, aralkyloxy group, aryloxy group, or -NR_xR_y group (where R_x and R_y denote independently a C₁₋₂₀ alkyl group or aralkyl group), and any two of X¹, X², X³, and X⁴ may form a ring) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



(where R¹ denotes a C₂₋₁₀ alkyl group having a hydrogen atom at the β position and X⁵ denotes a halogen atom), and a compound having a carbon-carbon unsaturated bond;

wherein when the compound having a carbon-carbon unsaturated bond is an olefin, the olefin is selected from the group

consisting of a substituted or unsubstituted halogenated allyl and a substituted or unsubstituted allyl alcohol derivative.--

--Claim 29. A process for an addition reaction which comprises combining a compound having a carbon-carbon unsaturated bond and a compound having an electrophilic functional group or an electrophilic reagent, in the presence of a titanium compound represented by the formula (1) below



(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-\text{NR}_x\text{R}_y$ group (where R_x and R_y denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



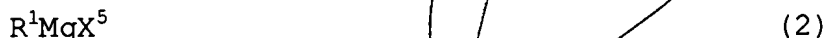
(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom);

wherein when the compound having a carbon-carbon unsaturated bond is an olefin, the olefin is selected from the group consisting of a substituted or unsubstituted halogenated allyl and a substituted or unsubstituted allyl alcohol derivative.--

--Claim 30. A process for an addition reaction which comprises adding to an organotitanium reacting reagent comprising:
a titanium compound represented by formula (I) below



(where X^1 , X^2 , X^3 , and X^4 denote independently a halogen atom, C_{1-20} alkoxy group, aralkyloxy group, aryloxy group, or $-\text{NR}_x\text{R}_y$ group (where R_x and R_y denote independently a C_{1-20} alkyl group or aralkyl group), and any two of X^1 , X^2 , X^3 , and X^4 may form a ring) and a Grignard reagent represented by the formula (2) below in a molar amount 1-10 times as much as the titanium compound,



(where R^1 denotes a C_{2-10} alkyl group having a hydrogen atom at the β position and X^5 denotes a halogen atom), and a compound having a carbon-carbon unsaturated bond,

a compound having an electrophilic functional group or an electrophilic reagent, thereby performing an addition reaction on the compound having a carbon-carbon unsaturated bond in the presence of said organotitanium reacting reagent,

wherein when the compound having a carbon-carbon unsaturated bond is an olefin, the olefin is selected from the group